

# How Will Synthetic Biology **Change** the Way We Live?

**J. Craig Venter** and **Michael M. Crow**

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What is **life**?



**“How can the events in space and time which take place within the spatial boundary of a living organism be accounted for by physics and chemistry?... The obvious inability of present-day physics and chemistry to account for such events is no reason at all for doubting that they can be accounted for by those sciences.”**

**Erwin Schrödinger**

Austrian Physicist (1887-1961)

Nobel Prize, Physics (1933)

*What is Life* (1944)

Did we **answer** Schrödinger in  
2010? Are we **moving forward**  
from a unique human position  
now that **digital biology** is  
possible?

**Is life DNA-driven  
biological machines?**

# Closing the **gap** between

**Natural Science**

“What we know/understand”



**Design Science**

“What we do with what we know”

**Herbert Simon**

American political scientist, economist, sociologist (1916-2001)

*Sciences of the Artificial* (1969)

Nobel Prize, Economics (1978)

How does science  
fiction **foreshadow**  
the future?

Think *Arrowsmith*.

# The Panthéon





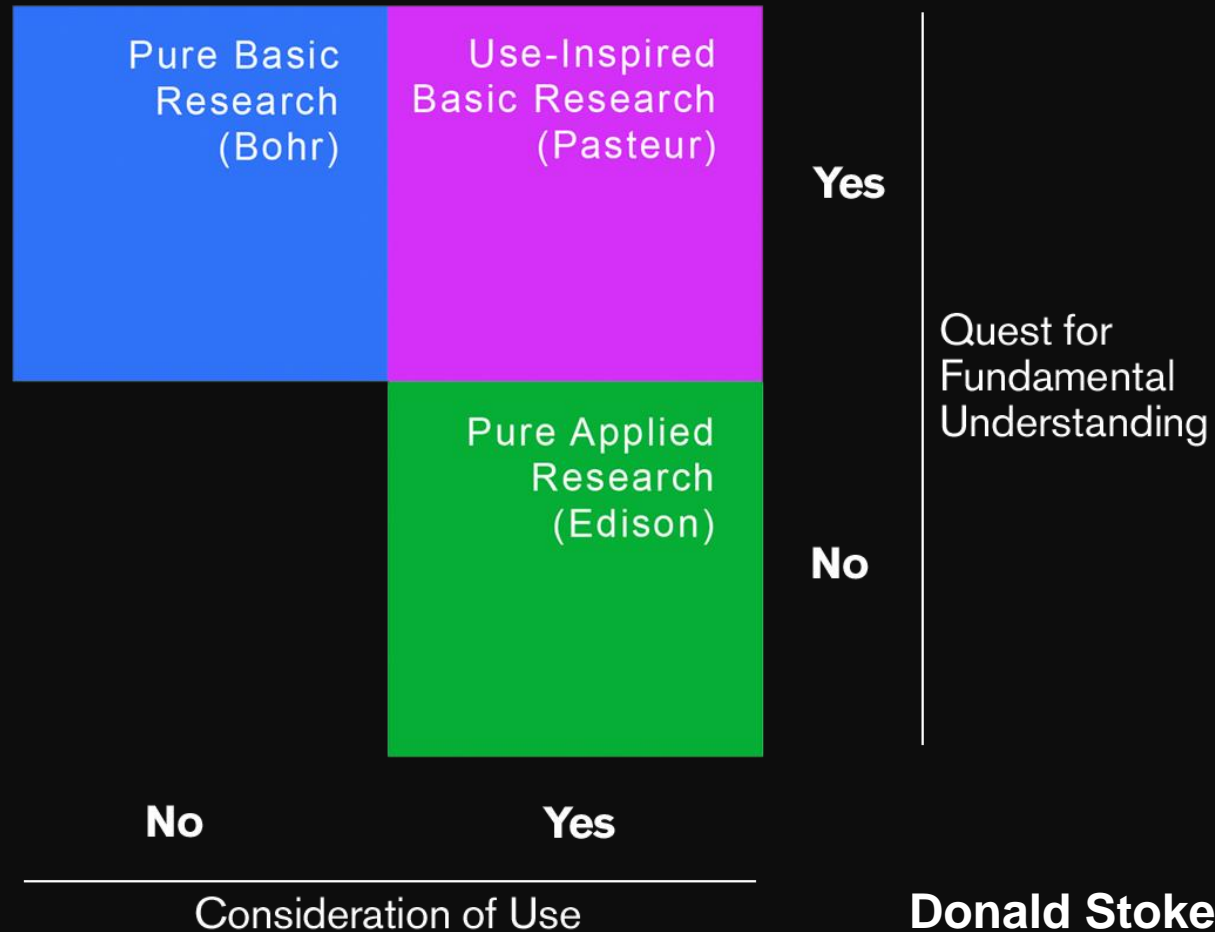
“I think, therefore I am.”

**René Descartes**

French philosopher, mathematician, physicist and writer (1596-1650)

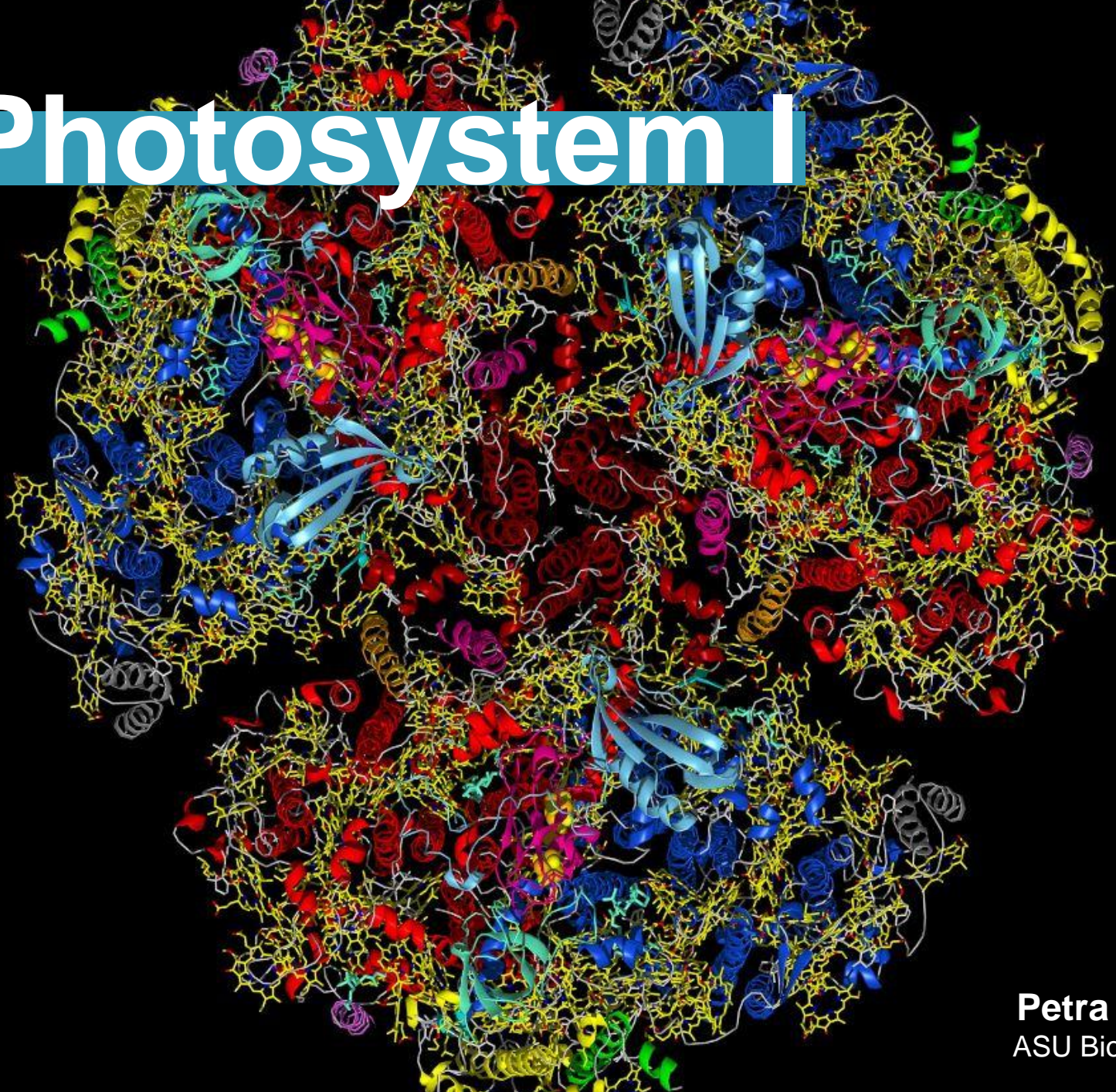
Principles of Philosophy (1644)

# Pasteur's Quadrant



**Donald Stokes**  
*Pasteur's Quadrant* (1997)

# Photosystem I



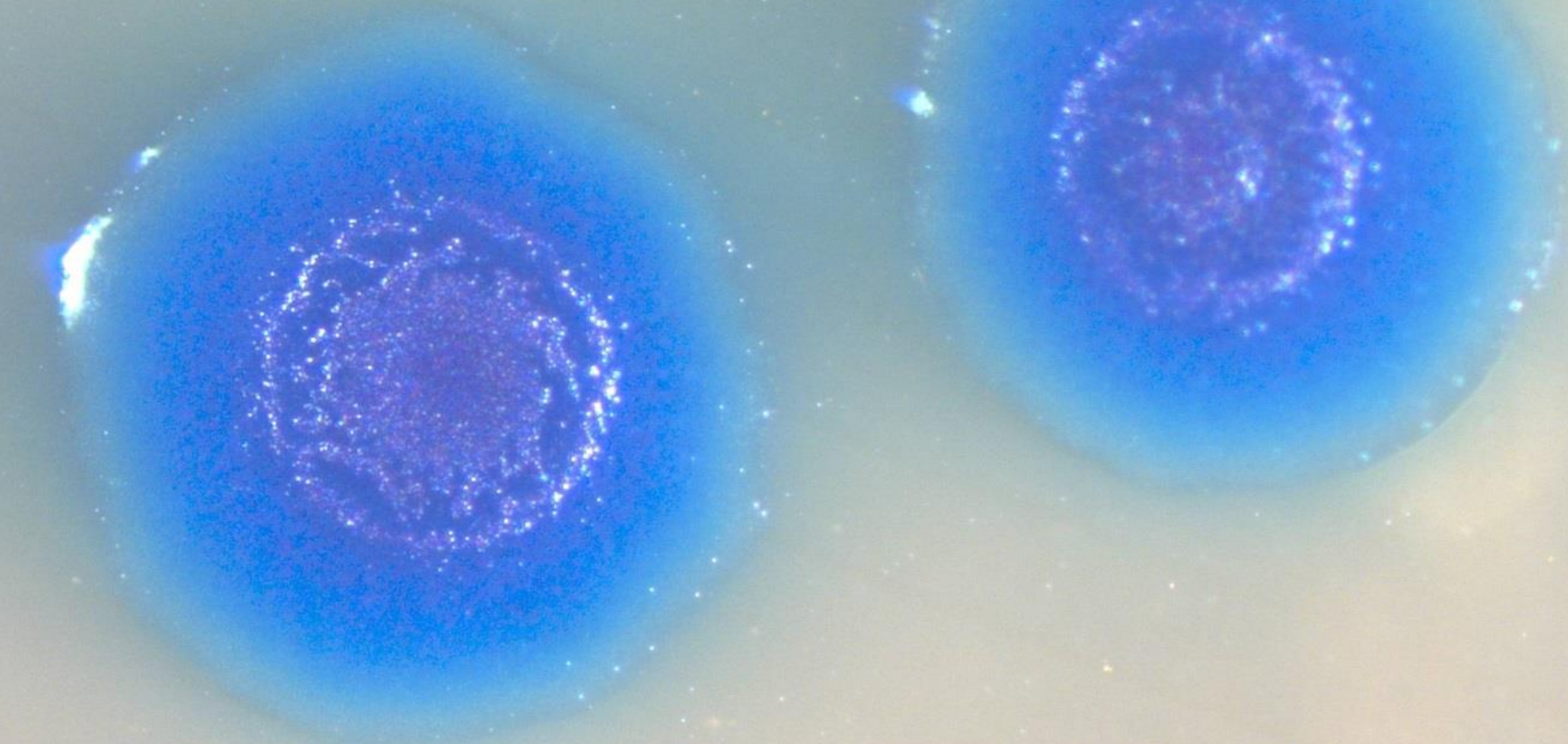
**Petra Fromme**  
ASU Bioenergy Lab

# An estimated 3.1% of your DNA is from Neanderthals

Michael Crow: 3.1% or 96th percentile

Average 23andMe user: 2.7%

# Synthetic Life



**Synthetic *M. mycoides* bacteria**

J. Craig Venter Institute (2010)

**“What I cannot create, I do not understand.”**

**Richard Feynman**

American Physicist (1918-1988)

Nobel Prize, Physics (1965)

# First Law of Robotics

“A robot may not injure a human being or, through inaction, allow a human being to come to harm.”

**Isaac Asimov**

American Author and Professor (1919-1992)

*Runaround* (1942)

**Thank You**

